REMARKS

Claims 1-16 and 31 have been amended by way of this preliminary amendment. Accordingly, claims 1-73 are now pending.

In accordance with 37 C.F.R. § 1.121(c)(1)(ii), separate sheet(s) with the rewritten claims marked-up to show the changes made to the previous version of the claims, is submitted herewith as Appendix A.

Prompt consideration of the pending claims is respectfully requested.

Respectfully submitted,

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APPENDIX A
SEPARATE SHEETS WITH MARKED-UP VERSION OF CLAIMS PER 37 C.F.R § 1.121(c)(1)(ii)

Claim 1 has been amended as follows:

1. (Amended) A communication device for use in a communications system [for generating an OFDM signal having frequency] that uses multiple tones distributed over a predetermined bandwidth [, the communication system] to communicate data, the device comprising:

[an allocation circuit that defines an allocated tone set selected from frequency tones distributed over a predetermined bandwidth;]

a mapping circuit that receives data symbols [from a symbol constellation] and maps the symbols to prescribed time instants in a [time domain symbol duration] predetermined time interval to generate a discrete signal [of] including mapped symbols, each mapped symbol corresponding to a discrete point in time; and

an interpolation circuit that receives the discrete signal and generates a continuous signal by applying [predetermined] an interpolation [functions] function to the discrete signal, the interpolation [functions] function operating on the discrete signal such that a frequency response of the continuous signal includes sinusoids having non-zero values at a first set of tones, the first set of tones being a subset of said multiple tones, the non-zero value at each of said first set of tones being a function of a plurality of mapped symbols corresponding to different discrete points in time, the frequency response of the continuous signal also including

zero values at a second set of tones, the second set of tones being different from said first set of tones and being another subset of said multiple tones [values of the continuous signal at the prescribed time instants are equal to the mapped symbols and a frequency response of the continuous signal includes sinusoids having non-zero values at frequency tones within the allocated tone set and zero values at the remaining frequency tones ; and

a sampling circuit that samples the continuous signal at discrete time instants distributed over the time domain symbol duration to generate a digital signal sample vector].

Claim 2 has been amended as follows:

2. (Amended) The [communication system] device of claim 1 wherein the discrete time instants are defined within the range of 0, T/N, 2T/N, ..., T(N-1)/N, where N is a total number of time instants in the [time domain symbol duration] predetermined time interval.

Claim 3 has been amended as follows:

3. (Amended) The [communication system] device of claim 1 wherein the frequency tones within the allocated tone set are contiguous frequency tones, and the prescribed time instants are equally spaced and uniformly distributed over one symbol duration.

Claim 4 has been amended as follows:

4. (Amended) The [communication system] device of claim 1 wherein the frequency tones within the allocated tone set are equally spaced frequency tones, and the prescribed time instants are equally spaced and uniformly distributed over a fraction of one symbol duration.

Claim 5 has been amended as follows:

5. (Amended) The [communication system] device of claim 4 wherein a fraction of one symbol duration is defined by 1/L where L is the spacing between two adjacent allocated frequency tones in the allocated tone set.

Claim 6 has been amended as follows:

6. (Amended) The [communication system] device of claim 1 wherein a total number of discrete time instants is greater than or equal to a total number of frequency tones distributed over the predetermined bandwidth.

Claim 7 has been amended as follows:

7. (Amended) The [communication system] device of claim 1 wherein the interpolation circuit further includes a memory for storing the predetermined interpolation functions, and an interpolation function module for retrieving the interpolation functions from the memory and applying the interpolation functions to the discrete signal to generate the continuous signal.

Claim 8 has been amended as follows:

8. (Amended) The [communication system] device of claim 7 wherein the interpolation functions comprise a matrix of precomputed sinusoidal waveforms.

Claim 9 has been amended as follows:

9. (Amended) The [communication system] device of claim 7 wherein the interpolation functions comprise continuous interpolation functions.

Claim 10 has been amended as follows:

10. (Amended) The [communication system] device of claim 1 wherein the mapping circuit replicates the discrete signal of mapped symbols to generate an infinite series of mapped symbols over prescribed time instants covering a time interval from $-\infty$ to $+\infty$.

Claim 11 has been amended as follows:

11. (Amended) The [communication system] device of claim 10 wherein the interpolation functions comprise sinc interpolation functions, and the interpolation circuit applies the sinc interpolation functions to the infinite series of mapped symbols.

Claim 12 has been amended as follows:

12. (Amended) The [communication system] device of claim 1 wherein the data symbols are complex symbols associated with a symbol constellation.

Claim 13 has been amended as follows:

13. (Amended) The [communication system] device of claim 1 further including a digital signal processor for implementing the mapping circuit and the interpolation circuit.

Claim 14 has been amended as follows:

14. (Amended) The [communication system] device of claim 1 further including a cyclic prefix circuit for receiving the digital signal sample vector from the sampling circuit and prepending a cyclic prefix to the digital signal sample vector.

Claim 15 has been amended as follows:

15. (Amended) The [communication system] device of claim 14 wherein the cyclic prefix circuit operates to copy an end portion of the digital signal sample vector and prepend the end portion to a beginning portion of the digital signal sample vector.

Claim 16 has been amended as follows:

16. (Amended) The [communication system] device of claim 1 further including a digital to analog converter operable to receive the digital signal sample vector and generate an analog signal for transmission within the communication system.

Claim 31 has been amended as follows:

31. (Amended) The communication system of claim [30] 1 wherein the continuous signal comprises an OFDM communication signal and wherein the value of the continuous signal at each of the prescribed time instants is a function of the mapped symbol at said prescribed time instant.